

REMARKS

Applicants request favorable reconsideration of this application in view of the foregoing amendments and the following remarks. Of claims 1-10 that were pending in the application, claims 1-6 and 10 were rejected in the Office Action. Applicants greatly appreciate the indication of allowable subject matter in claims 7-9. In response to this positive indication, claim 7 (*i.e.*, the claim from which claims 8 and 9 depend) has been amended to be in independent claim format and, therefore, claims 7-9 should be in condition for allowance. No other claim amendments are presented herein and, therefore, claims 1-10 remain pending for further consideration.

1. Rejections of Claims 1-6 and 10

The Examiner rejected claims 1-3, 5, and 10 under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent Application Publication No. 2004/0107035 (“Tange”) and claim 4 under 35 U.S.C. § 103(a) as allegedly being obvious in view of Tange. In addition, the Examiner rejected claim 6 under 35 U.S.C. § 103(a) as allegedly being obvious when considering Tange in view of U.S. Patent Application Publication No. 2004/0153228 (“Matsumoto”). For at least the following reasons, Applicants respectfully traverse each of these rejections.

As originally presented, claim 1 (*i.e.*, the claim from which claims 2-6 depend) recites a steering control apparatus for an automotive vehicle. This steering control apparatus includes, among other possible things (*italic emphasis added*):

- a camera photographing a travel path in a traveling direction of a vehicle;
- a lateral displacement calculating circuit that calculates a lateral displacement of the vehicle with respect to the travel path according to an image of the travel path photographed by the camera;
- a differentiator that *calculates a differential value of the lateral displacement*;
- a vehicle speed sensor that detects a vehicle speed;
- a relative yaw rate calculating section that *calculates a relative yaw rate* with respect to the travel path of the vehicle *on the basis of* the lateral displacement, *the differential value of the lateral displacement*, and the vehicle speed;
- an actuator that provides an assistance force for the steering mechanism; and
- an actuator controlling section that drivingly controls the actuator in a direction toward which the relative yaw rate is cancelled on the basis of the relative yaw rate.

Similarly, as originally presented, claim 10 recites a steering control method for an automotive vehicle. This method includes, among other possible steps (*italic emphasis added*):

photographing a travel path in a traveling direction of a vehicle using a camera;
 calculating a lateral displacement of the vehicle with respect to the travel path according to an image of the travel path photographed by the camera;
calculating a differential value of the lateral displacement;
 detecting a vehicle speed;
calculating a relative yaw rate with respect to the travel path of the vehicle *on the basis of the lateral displacement, the differential value of the lateral displacement, and the vehicle speed;*
 providing a steering assistance force for the steering mechanism using an actuator; and
 drivingly controlling the actuator in a direction toward which the relative yaw rate is cancelled on the basis of the relative yaw rate.

As hereafter explained, Tange and Matsumoto (standing alone or combined) fail to teach or suggest the steering control apparatus recited in claim 1 or the steering control method recited in claim 10.

In rejecting claims 1 and 10, the Examiner asserts that Tange teaches: (a) a differentiator that calculates a differential value of the lateral displacement (claim 1); and (b) calculating a differential value of the lateral displacement (claim 10). Applicants respectfully disagree. The differential value of the lateral displacement is mathematically defined, as discussed in ¶¶ [0024]-[0025] of the instant application, based on the following equation and subsequent Laplace Transform:

$$Y = L \psi + \int V_x \bullet \psi \bullet dt$$

$$Y_s = (Ls + V_x) \psi,$$

where L is the predetermined forward distance, s denotes a Laplace Transform, ψ is the initial yaw rate, and V_x is vehicle speed. In contrast to such a differential value of the lateral displacement, the cited portions of Tange (*i.e.*, ¶¶ [0028], [0032]) teach an estimated future lateral displacement value X_s . In other words, Tange fails to teach or suggest: (a) calculating a differential lateral displacement; and (b) calculating a relative yaw rate based in part on the calculated differential lateral displacement. Accordingly, Tange fails to teach or suggest at least the above-italicized limitations of claims 1 and 10. Moreover, it is respectfully noted that Matsumoto fails to cure this deficiency of Tange.

As Tange and Matsumoto (standing alone or combined) fail to teach or suggest at least the above-italicized limitations of claims 1 and 10, the references can not be used to reject these claims, or any claim dependent thereon, under 35 U.S.C. §§ 102(e), 103(a). Moreover, as claims 2-6 depend from claim 1, each of these dependent claims is also allowable over Tange and Matsumoto, without regard to the other patentable limitations

recited therein. Accordingly, a withdrawal of the various rejections of claims 1-6 and 10 under 35 U.S.C. §§ 102(e), 103(a) is both warranted and respectfully requested.

2. Conclusion

For the aforementioned reasons, claims 1-10 are now in condition for allowance. A Notice of Allowance at an early date is respectfully requested. The Examiner is invited to contact the undersigned if such communication would expedite the prosecution of the application.

Respectfully submitted,

JUN 28 2006

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THE COMMISSIONER IS HEREBY AUTHORIZED TO CHARGE ANY ADDITIONAL FEES WHICH MAY BE REQUIRED REGARDING THIS APPLICATION UNDER 37 C.F.R. §§ 1.16-1.17, OR CREDIT ANY OVERPAYMENT, TO DEPOSIT ACCOUNT NO. 19-0741. SHOULD NO PROPER PAYMENT BE ENCLOSED HEREWITH, AS BY A CHECK BEING IN THE WRONG AMOUNT, UNSIGNED, POST-DATED, OTHERWISE IMPROPER OR INFORMAL OR EVEN ENTIRELY MISSING, THE COMMISSIONER IS AUTHORIZED TO CHARGE THE UNPAID AMOUNT TO DEPOSIT ACCOUNT NO. 19-0741. IF ANY EXTENSIONS OF TIME ARE NEEDED FOR TIMELY ACCEPTANCE OF PAPERS SUBMITTED HEREWITH, APPLICANT HEREBY PETITIONS FOR SUCH EXTENSION UNDER 37 C.F.R. § 1.136 AND AUTHORIZES PAYMENT OF ANY SUCH EXTENSIONS FEES TO DEPOSIT ACCOUNT NO. 19-0741.